



Enabling new
applications with High
Throughput Satellites in
Software Defined Multi
Bearer Networks

Dr. Jaime Reed

VP Space Data Platforms and Applications

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CGI's expertise for SDN, converged networks and 5G



- > No individual company can be expected to understand and deliver everything around 5G - the technology and connectivity options, and use cases, are just too numerous.
- > CGI partners with major suppliers to offer our customers the best 5G journey, optimized for your business and supported by experts in all phases.
- > We work with our partners to prepare business for a secure, high bandwidth, connected future.

Why use SDN?

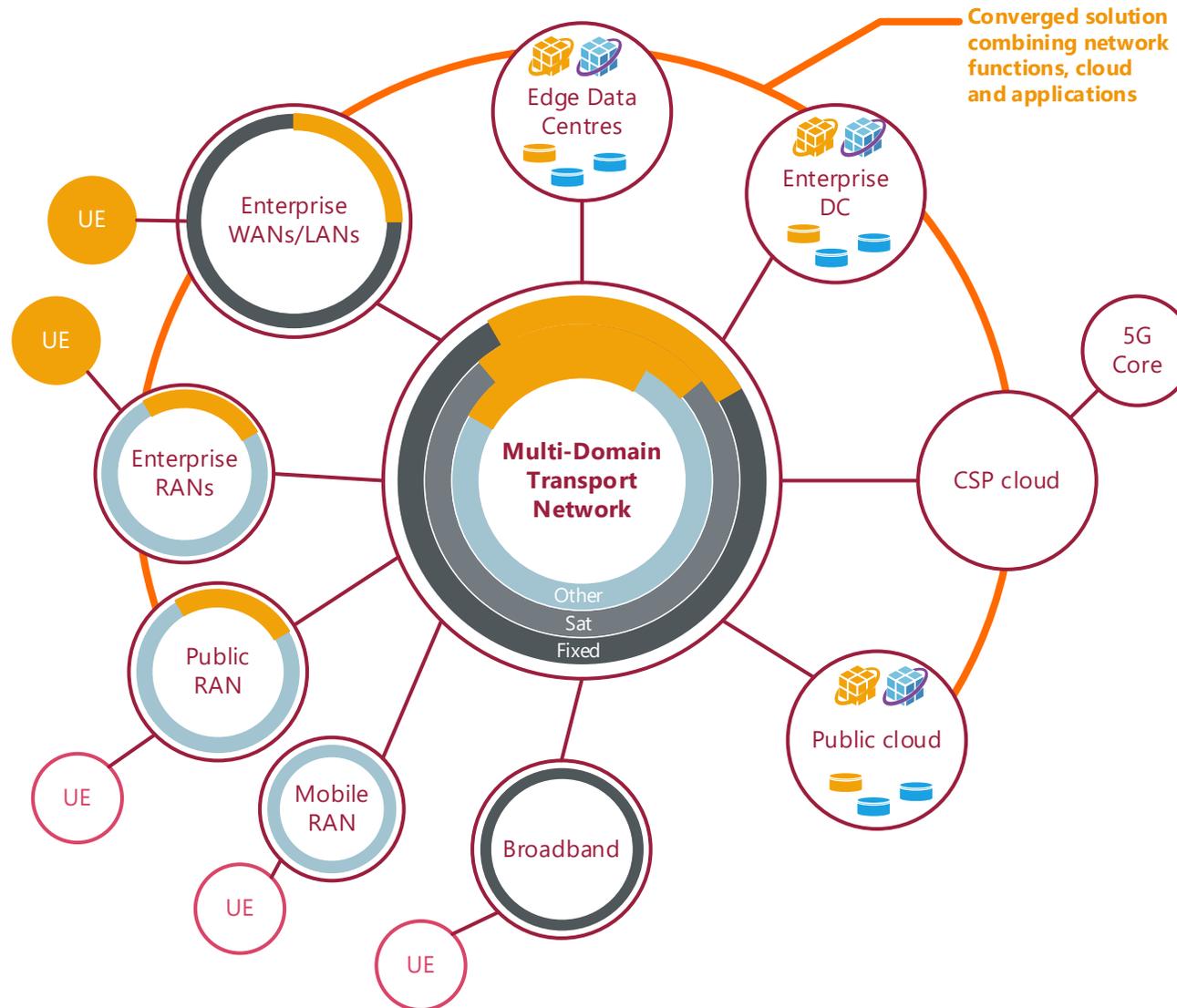
The type of applications and services being deployed are becoming ever more complex and difficult to manage:

- Rise of Hyperconverged Infrastructure (HCI) combining compute, storage and network
- SD-WAN allows enterprise networks to automatically adapt to the applications and demand to drive business agility and rapidly allow the creation of new services to respond to customer demand

Uptake of SDN is accelerating in the Enterprise:

- Increase use of internet compared to MPLS; 58% of companies expect to connect sites by internet only
- 63% of SD-WAN projects are part of a wider IT integration project
- Shift to Cloud places ever greater importance on network performance as intrinsic to UX
- >50% of CSPs increasing investment in SDN
- 78% of service providers planning to primarily host their telecoms IT systems in the Cloud (but this is not the same as workload)
- CSPs already have SDN offerings into the market, e.g. Orange Flexible SD-WAN
- SDN a key element of the 5G proposition
- Events like COVID-19 have illustrated importance of agility in service delivery (especially automation)
- Satellite operators will need to offer virtualizable functions to their customers, but can also utilize SDN themselves

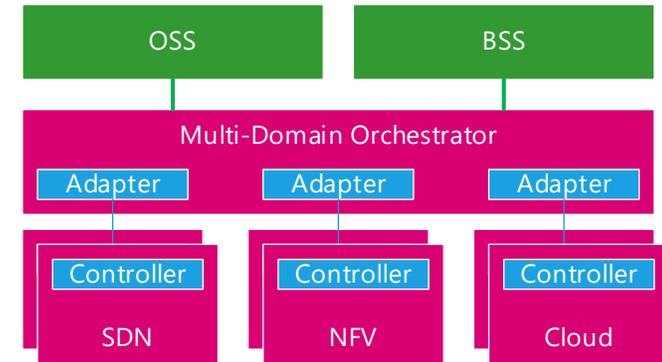
Towards a flexible network



- Hyperconverged Infrastructure based on SDN can rapidly adapt to meet new requirements and scale to meet demand
- Network infrastructure can be aligned to applications
- SDN is the basis for deeper 5G integration and network slicing
- Need to consider software defined compute and storage
- SatCom has a role to play in converged networks:
 - Mobility solutions/RANs
 - Events
 - Resilience
 - Cell backhaul
 - Offload
- SDN will enable greater flexibility and ease of using SatCom

Multi-Domain Orchestration

- A completely flexible network and HCI is feasible today
- Integration of SatCom into the network requires a multi-domain orchestration with adapters for SatCom
- Several MDO solutions are available (with differing levels of maturity)
- CGI is focused on Open Industry Standards (ETSI, ONF, MEF and TM Forum).
- CGI has a vendor neutral approach and is using a number of different solutions in our projects



BROCADE
A Broadcom Company

ciena

blueplanet

Open Source
MANO

OPEN
DAYLIGHT

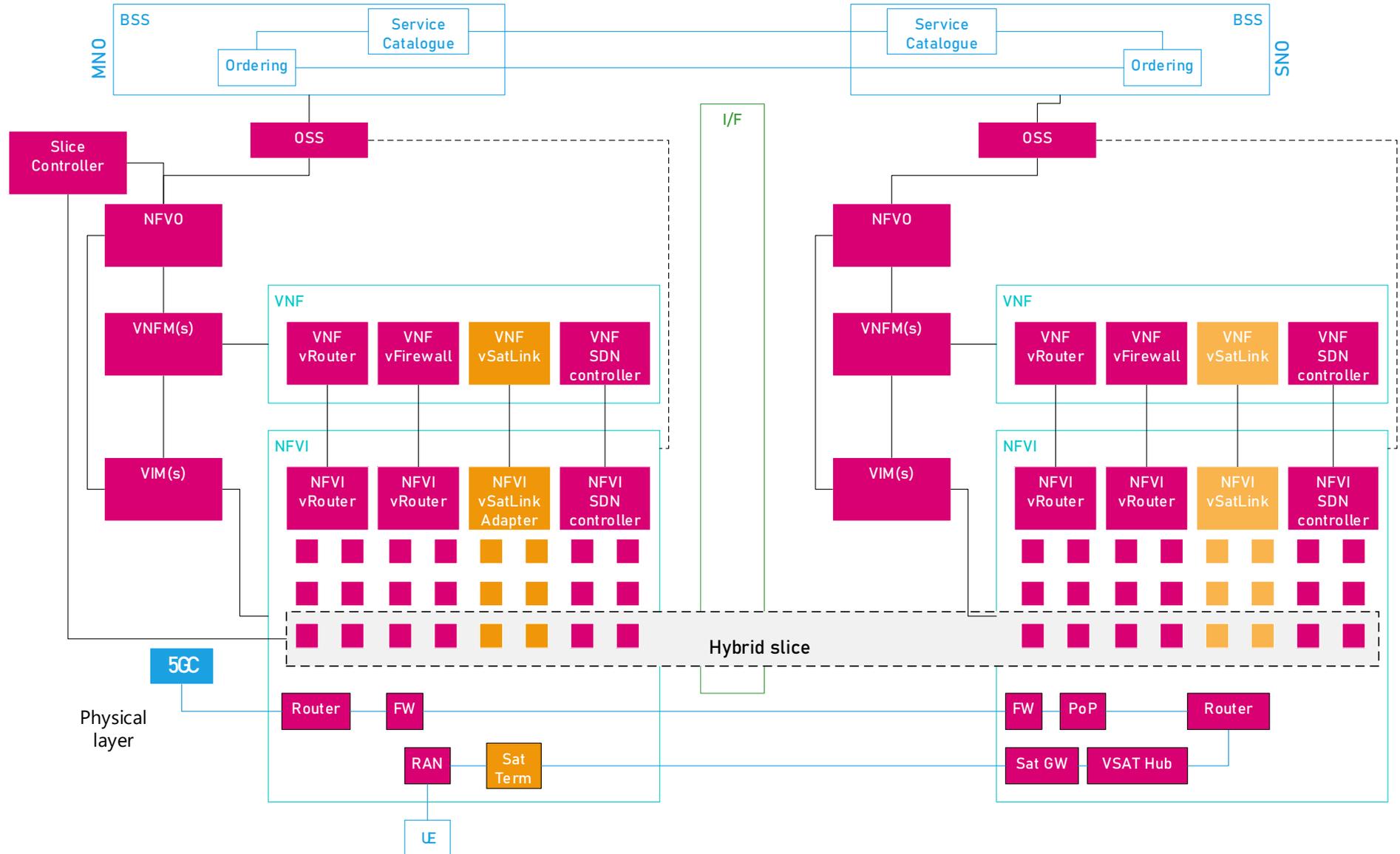
ONAP
OPEN NETWORK ALLOCATION PLATFORM

openstack.

OPNFV

How might we create hybrid network slices?

- Still an immature technology
- This diagram assumes virtualization on both sides but I/F can implement translation if one side is not virtualized
 - Envisages 2 VNFs:
 - one on the MNO side – used for controlling the requested satellite function
 - one on the SNO side – used for managing the requested (sliced) function
- Satellite terminal (and RAN) controlled by MNO VNF for true integration
 - Requires terminal to support slicing functionality (which is more than VLAN support)



Some use cases enabled by SatCom SDN

Emergency Services

- Rapid deployment of augmentation services and targeted resilience
- Rapid uplift of capacity blended with terrestrial networks
- SDN enables flexibility and ability to control SLAs

Mobility networks

- Provision of connectivity to moving platforms
- Seamless connectivity for passengers already available today via WiFi, extension of these services to 5G but this requires a dynamic network solution as moving RANs roam between host networks and supporting UE roaming

Hybrid resilience

- Provision of hybrid resilience features to critical industries, especially for safety critical applications involving automation, e.g. external robotics
- SatCom connectivity used as a back-up solution or a safety solution

Conclusions

SD-WAN is reaching a tipping point in uptake

Hyperconverged infrastructure (including MEC) is the next trend

Virtualized and SDN-ready Satellite systems can be integrated into these networks to rapidly create new applications and services, as well as augment existing solutions

CGI brings independent SI capability with pre-integrated partner components to provide E2E solutions, including managed services